

Karen A. Thorsett-Hill
Teaching Associate Professor
Department of Mechanical Engineering and Engineering Science
The University of North Carolina at Charlotte
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Education:

University of Memphis	Mechanical Engineering	BSME 1991
California State University, Fresno	Business Administration	MBA 1997
University of North Carolina at Charlotte	Mechanical Engineering	MSME 2010
University of North Carolina at Charlotte	Mechanical Engineering	Ph.D. 2012

Professional Experience:

Teaching Associate Professor (2012 – Current) Department of Mechanical Engineering and Engineering Science, University of North Carolina at Charlotte. Teach undergraduate heat transfer, fluid dynamics, statics, thermodynamics, solid mechanics, and materials science. Served as undergraduate advisor to mechanical engineering majors. Mentored several senior design projects. Founded and mentored the award-winning 49er Rocketry Club and NASA USLI competition rocket team and the student AIAA chapter. Serve as application review chairperson for the Levine Scholars program. Served as faculty advisor of ASME student chapter. Served as a hiring committee member for tenure track and non-tenure track faculty. Serve as the thermal-fluids faculty FAIT (focus area improvement team) chair. Nominated by the mechanical engineering department for the College of Engineering undergraduate teacher of the year in 2015, 2016, and 2017.

Adjunct Summer Instructor (Summer 2017, 2018, and 2019) Mechanical Engineering Department, University of Colorado, Boulder.

Taught undergraduate summer courses in heat transfer, fluid mechanics, and solid mechanics. Currently contracted to teach heat transfer in Summer 2020.

Lecturer (2010-2012), Department of Mechanical Engineering and Engineering Science, University of North Carolina at Charlotte. Taught calculus and calculus for technology majors. Taught materials science, instrumentation, statics, and thermodynamics.

Lecturer (2005-2009), Departments of Mechanical Engineering and Civil Engineering, California State University, Sacramento. Taught calculus-based statistics, engineering economics, materials lab, thermodynamics recitation, materials science recitation, drafting and interpreting engineering drawings, and a civil engineering technology lab.

Finance Director – SBC Northern California Construction and Engineering Division (2002-2005)

Managed a \$156 million capital budget and \$41 million expense budget for an organization of 943 personnel.

Area Manager – SBC Northern California Digital Engineering (2000-2001)

Successfully led 24 engineers in the first design and roll-out of digital subscriber line (DSL) in Northern California.

Outside Plant Design Engineer/Chief of Staff to the General Manager of Construction and Engineering – SBC Fresno, California (1998-2000)

Designed cable and fiber loop telephone systems to serve business and residential areas. Interfaced with other utility companies, developers, and customers to determine best engineering designs and cost-efficient engineering solutions. Served as assistant to the general manager responsible for 998 employees. Resolved escalated customer issues, handled public affairs issues, led the establishment of organization annual goals and objectives, assisted in budget development.

U.S. Navy Officer - Civil Engineer Corps (1985-1997)

Prior enlisted from 1985-1991. As Officer in Charge of Construction at NAS Fallon, NV was responsible for overseeing the construction of facilities to relocate Top Gun to NAS Fallon. Awarded the Navy Achievement Medal. Served as first female in a Seabee combat-ready battalion, NCFSU-2, Port Hueneme, California. Responsible for overseeing the rapid deployment of construction equipment and personnel in support of U.S. Marines in combat zones.

Publications

- Keanini, R.G., Tkacik, P., Srivastava, N., **Thorsett-Hill, K.**, and Tomsyck, J. (2013) “Millisecond-scale shock-train evolution in high pressure ratio rocket nozzles: schlieren imaging and qualitative analysis of shock-boundary layer interaction,” in press, *Proc. Inst. Mech. Engrs. G, J. Aerospace Engrg.*
- Russell Keanini, Thomas Nortey, **Karen Thorsett-Hill**, Nilabh Srivastava , Peter Tkacik, Sam Hellman and P. Douglas Knight, “**CHAPTER** : Shock-Induced Boundary Layer Separation in Over-Expanded Rocket Nozzles: Physics, Models, Random Side Loads, and the Diffusive Character of Stochastic Rocket Ascent,” **BOOK: Mass Transfer / Book 3, [ISBN : 978-953-308-74-5]** (2011)
- Contributor to Engineering Economic Analysis. 10th Edition. Newnan, Eschenbach, and Lavelle. (2008).

Research and Education Grants

Submitted \$200,000 proposal for the NASA USIP Program to demonstrate autonomous docking of CubeSats in Zero-G (2015).

NASA Senior Design Grant 2015 (K. Thorsett-Hill) North Carolina Space Grant Consortium, \$2,000.

NASA Undergraduate Student Competition Grant 2015 (K. Thorsett-Hill) North Carolina Space Grant Consortium, \$5,000.

NASA Senior Design Grant 2014 (K. Thorsett-Hill, R. Keanini) North Carolina Space Grant Consortium, \$2,500.

NASA Undergraduate Student Competition Grant 2014 (K. Thorsett-Hill, R. Keanini) North Carolina Space Grant Consortium, \$5,000.

NASA Senior Design Grant 2012-2013 (K. Thorsett-Hill, P. Schmidt) North Carolina Space Grant Consortium, \$2,500.

NASA Undergraduate Student Competition Grant 2012-2013 (K. Thorsett-Hill, P. Schmidt) North Carolina Space Grant Consortium, \$5,000.

Service Activities

Levine Scholars Faculty Affiliate: Through a competitive process, was selected to accompany and mentor the Levine Scholars class of 2017 on their 25-day NOLS (National Outdoor Leadership School). Attend various Levine Scholar functions and participate as chairperson of one application committee for future Levine Scholars classes. The Levine Scholars Program is UNC Charlotte's premier full-scholarship program attracting the best and brightest young scholars to UNC Charlotte.

AIAA Student Branch Faculty Advisor: Founding faculty advisor and current mentor for UNC Charlotte's new AIAA Student Branch.

49er High-Powered Rocketry Club Faculty Advisor: Founding faculty advisor for this club that promotes careers in aerospace and rocket science. Mentor students in designing, building, and launching high-powered hobby rockets and in the design and build of a rocket engine test stand.

NASA University Student Launch Initiative Competition Team and Senior Design Team Advisor: Former faculty advisor for multidisciplinary award-winning team of up to eighteen undergraduate students. Teams engage in a year-long senior design project and compete in design and launch competitions at NASA Marshall Space Flight Center at the end of the year. Teams also engage in STEM outreach at local Charlotte schools. Team awards include: NASA USLI Best Design Award (2013), NASA USLI Second Place Overall (2014) and National Instruments Global LabVIEW Student Design Competition, 3rd Place in the worldwide competition (2014).

ASME Faculty Advisor (2012-2014): Advised the student section of ASME. More than tripled the number of student members of ASME over a two-year time period. Advised the human-powered vehicle team in designing and building a vehicle for national competition.